REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 13, 15, 17, and 19-24 are presently active in this case. Claims 1-12 and 16 were cancelled by previous amendments. The present Amendment amends Claims 13, 15, 19 and 21 without introducing any new matter or raising new issues that would require further search and/or consideration by the Examiner; and cancels Claims 14 and 18 without prejudice or disclaimer.

The outstanding Office Action objected to the specification as not having the appropriate headings as required under 37 C.F.R. § 1.77(b). Claims 13, 17-18, and 24 were rejected under 35 U.S.C. § 102(b) as anticipated by Holve et al. (German Patent Publication DE 2803740, hereinafter "Holve"). Claims 13-15, and 17-18 were rejected under 35 U.S.C. § 102(b) as anticipated by Steiner et al. (German Patent Publication DE 2350602, hereinafter "Steiner"). Claims 19-22 were rejected under 35 U.S.C. § 103(a) as unpatentable over Steiner. Claim 23 was rejected under 35 U.S.C. § 103(a) as unpatentable over Steiner, in view of Brichard et al. (U.S. Patent No. 3,921,359, hereinafter "Brichard")

First, Applicants respectfully request that the references AO and AP cited in the Information Disclosure Statement filed together with the Application on January 7, 2005 be acknowledged as having been considered in the next Office Action. The references were cited in a European Search Report of a European counterpart application, and the Search Report was also submitted to the U.S.P.T.O., thereby serving as a statement of relevancy.

In response, independent Claim 13 is amended to recite all the features of dependent Claims 14 and 18, and is amended to correct some minor formal issues, to recite "wherein side walls of the interior frame and internal walls of the at least two substrate sheets define at least one microcavity having dimensions to form a zone of thermoviscous losses for acoustic

waves entering from the flat cavity." These features find also non-limiting support in Applicants' disclosure as originally filed, for example in Figs. 1-3, and in the specification at p. 7, ll. 11-30, the table on p. 8, and in the experimental results of Fig. 4. No new matter has been added. The amendments also do not raise any new issues, because the pending Office Action has considered these features, and no additional search and/or consideration is required.

Consequently, Claims 14 and 18 are cancelled without prejudice or disclaimer, and dependent Claims 15, 19 and 21 are amended to change the claim dependency to independent Claim 13.

In response to the rejection of Applicants' claims under 35 U.S.C. §§ 102(b) and 103(a), Applicants respectfully request reconsideration of these rejections and traverse the rejections, as discussed next.

Briefly summarizing, Applicants' Claim 13 is directed to an acoustic insulating glazing unit. The glazing unit includes at least two substrate sheets, joined together around their periphery using a sealed joint/spacer frame, the sealed joint/spacer frame defining with the two substrate sheets a flat cavity that is filled with a gas, an interior frame that is arranged inside the flat cavity in a periphery of the flat cavity. In addition, ***side walls of the interior frame and internal walls of the at least two substrate sheets define at least one microcavity having dimensions to form a zone of thermoviscous losses for acoustic waves entering from the flat cavity***, and the interior frame includes an inner chamber and opening slots that are arranged in the side walls of the interior frame, the inner chamber configured to receive the acoustic waves escaping from the at least one microcavity through the opening slots. Moreover, ***a height of the at least one microcavity from an upper wall of the interior frame to the opening slots is at least 6 mm, and the at least one microcavity has a width between 0.2 mm and 1 mm***.

As explained in Applicants' specification starting at p. 2, l. 1, the acoustic waves become "exhausted" by friction against the interior walls of the substrate sheets and the side walls of the hollow frame, thereby causing thermovisccous losses. These areas are claimed as "microcavities." In other words, the acoustic wave energy is transformed into thermal energy, and therefore the overall acoustic energy in the glazing unit is reduced. Moreover, the opening slots that are arranged at least 6 mm from the upper wall of the interior frame provide for additional acoustic attenuation, as shown in Fig. 4 for different arrangements of the opening slots and the resulting length of the microcavity. The combined effect of the microcavities providing friction to acoustic waves, and the opening slots that lead into an inner chamber in an interior frame provide improved acoustic attenuation. This is described in Applicants' specification from p. 3, l. 36, to p. 4, l. 5. to recite:

> The slot or slots will be placed in the lower part of the section opposite the cavity, namely as close as possible to the bottom of the microcavities so as to maximize the useful height of the microcavities and consequently the area of the friction surfaces. It will be understood that the term "useful height" of a microcavity is understood to mean the distance between the upper plane of the slot and the plane where the microcavity runs into the cavity.

Please note that the this discussion on the advantages of Applicants' Claim 13 features is for explanatory purposes only and is not intended to limit the scope of the claims in any fashion.

Turning now to the applied references, Holve describes a multilayer insulation glass with external glass layers 1, 2, having a spacer profile 3 in an edge area of the glass layers 1, 2. (Holve, Abstract.) A hollow profile 7 is arranged inside the multilayer insulation glass including holes 73, 74 allowing air circulation to and from the hollow profile 7. (Holve, p. 8, ll. 8-10.) With respect to the hollow profile 7, Holve explains that holes 73, 74 are arranged on opposite sides of sidewalls, and are shifted towards each other. (Holve, p. 8, ll. 10-12.) It is thereby possible that the acoustic waves that enter the hollow profile 7 are attenuated and the acoustic energy is reduced. (Holve, p. 8, ll. 12-14.)

However, Holve fails to teach side walls of the interior frame and internal walls of the at least two substrate sheets define at least one microcavity having dimensions to form a zone of thermoviscous losses for acoustic waves entering from the flat cavity, as required by Applicants' Claim 13. First, as discussed above, Holve clearly explains that the attenuation of the acoustic waves happens inside the hollow profile 7, after the acoustic waves have to enter the hollow profile. Second, as shown in Holve's Fig. 1, the distance between sidewalls of the hollow profile 7 and the inner surfaces of the glass layers 1, 2 is to big to allow the causation of thermoviscous losses to acoustic airwaves. In this respect, Holve explains at page 6, ll. 7-12, that the hollow profile needs to have sufficient distance between the side walls, and the glass layers 1, 2. Applicants traverse the contentions of the pending Office Action that Holve "does show the same structure as recited." (Office Action, p. 5, ll. 20-22.) Claim 13 clearly requires that the microcavity has dimensions "to form a zone of thermoviscous losses for acoustic waves entering from the flat cavity," and this is not the case in Holve as discussed above.

Moreover, Claim 13 further requires that a height of the at least one microcavity from an upper wall of the interior frame to the opening slots is at least 6 mm and that the at least one microcavity has a width between 0.2 mm and 1 mm. The cited passages of Holve fail to teach such a feature.

The reference Steiner, used by the pending Office Action to form a 35 U.S.C. § 102(b) rejection, also fails to teach all the features of Applicants' independent Claim 13. Steiner is directed to a multilayer insulation glass frame, having two external glass layers 1, 2, with a spacer 3 to keep the layers 1, 2 at a predetermined distance. (Steiner, p. 3, ll. 26-31, Fig. 1.) Inside the glass frame, there is an u-shape profile 6 that is connected to the spacer 3, and the interior space 5 of the profile 6 is filled with absorbing material. (Steiner, p. 4, ll. 12-

20, Fig. 1.) The profile 6 is perforated with many holes, and interior space 5 of profile 6, and the interior space of spacer 3 are connected by a hole 8. (Steiner, p. 4, 21-22.)

First, Steiner fails to teach side walls of the interior frame and internal walls of the at least two substrate sheets define at least one microcavity having dimensions to form a zone of thermoviscous losses for acoustic waves entering from the flat cavity, as required by Applicants' Claim 13. For example, in Steiner's Fig. 1, there are multiple holes that are aligned with each other along a potential propagation direction of acoustic waves in the gap that is formed between profile 6 and glass layer 1, and therefore the holes in the profile, having a substantial size, will absorb all the acoustic energy into the profile 6 and the filling material 7. In addition, the cited passages of Steiner also fail to teach that a height of the at least one microcavity from an upper wall of the interior frame to the opening slots is at least 6 mm, and the at least one microcavity has a width between 0.2 mm and 1 mm. As seen in Steiner's Fig. 1, there is no distance from the upper wall of profile 6 to the holes.

Applicants also respectfully submit that Steiner teaches away from the feature of Applicants' Claim 13 directed to absorption of acoustic waves, because Steiner's invention is clearly directed to absorb pressure variations that result from changes of the volume of the interior space between the glass layers 1, 2 due to strong temperature variations, to compensate for the change in pressure in the filling material 7 of profile 6. (Steiner, p. 3, ll. 7-23.) The result is that there is less deformation of the insulating material 11 that will reduce leakage. (Id. p. 3, ll. 11-12.)

The reference Brichard, used by the pending Office Action in the context of a 35 U.S.C. § 103(a) rejection, fails to remedy the deficiencies of Holve and/or Steiner, even if we assume that the combination is proper.

Birchard is directed to a multiple-pane glazing having a metal joint 26 that is soldered to the end edges 27 of sheets of glass 30, 31. (Birchard, Fig. 8, ll. 46-49.) A spacer 29 is

placed between the two sheets of glass 30, 31. (Birchard, Fig. 8, ll. 50-53.) But Birchard also fails to teach side walls of the interior frame and internal walls of the at least two substrate sheets define at least one microcavity having dimensions to form a zone of thermoviscous losses for acoustic waves entering from the flat cavity, as required by Applicants' Claim 13, and is also silent of the height of the microcavity.

Therefore, even if the combination of the references Holve, Steiner and/or Brichard, patents is assumed to be proper, the cited passages of the combination fails to teach every element of Applicants' Claim 13. Accordingly, Applicants respectfully traverse, and requests reconsideration of these rejections based on these references.

Applicants also traverse the pending Office Action's statement that some of the features of Applicants' claims are within ordinary skill in the art. Applicants' specification describe particular dimensions for the height and width of the microcavity, and these dimensions are the result of experimental testing to achieve superior acoustic attenuation performance of the acoustic insulating glazing unit, as shown in Figure 4. As can be seen from that figure, microcavities having a length above 6 mm show superior performance for acoustic attenuation in a range starting from 160Hz to 800Hz. This shows the criticality of such dimensions to provide a superior insulating glazing unit, and is further evidence of the non-obviousness of the features of Applicants' Claim 13.[1]

The present amendment is submitted in accordance with the provisions of 37 C.F.R. § 1.116, which after Final Rejection permits entry of amendments placing the claims in better form for consideration on appeal. As the present amendment is believed to overcome outstanding rejections under 35 U.S.C. §§ 102(b) and 103(a), the present amendment places the application in better form for consideration on appeal. In addition, the present amendment is not believed to raise new issues because the changes to Claim 13 merely recite

[1]See In re Aller, 220 F.2d 454, 456, (CCPA 1955).

features previously introduced in Claim 15 and 18 and to correct a formal issue, and Claim 19 is changed to amend the claim dependency. It is therefore respectfully requested that 37 C.F.R. § 1.116 be liberally construed, and that the present amendment be entered.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 13, 15, 17, and 19-24 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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